

A¹ is a Continuation of U.S. Patent Application Serial No. 08/484,661, now U.S. Patent No. 6,001,645.--.

IN THE CLAIMS:

Please ~~cancel~~ Claims 1-21.

Please add the following Claims:

A² 22. A composition comprising a purified non-naturally-occurring DNA polymerase, or fragments thereof, capable of DNA synthetic activity, said polymerase derived from *Thermotoga neapolitana*.

23. A composition comprising a mutant DNA polymerase, said mutant polymerase derived from a *Thermotoga neapolitana* DNA polymerase.

24. The composition of Claim 23, wherein said mutant DNA polymerase comprises a mutation that reduces a 3'-5' exonuclease activity of said DNA polymerase.

25. The composition of Claim 23, wherein said mutant DNA polymerase comprises a mutation that reduces a 5'-3' exonuclease activity of said DNA polymerase.

26. The composition of Claim 23, wherein said mutant DNA polymerase comprises a mutation resulting in said DNA polymerase having reduced discrimination against dideoxynucleotides.

27. The mutant DNA polymerase of Claim 23, wherein said mutant DNA polymerase comprises one or more amino acid substitutions.

28. The mutant DNA polymerase of Claim 23, wherein said mutant DNA polymerase comprises one or more amino acid deletions.

29. The composition of Claim 23, wherein said mutant polymerase is devoid of an N-terminal 5'-3' exonuclease domain.

30. The composition of Claim 23, wherein said mutant polymerase is devoid of the 283 N-terminal amino acids of native *Thermotoga neapolitana* DNA polymerase.

31. A composition comprising an isolated nucleic acid encoding a mutant *Thermotoga neapolitana* DNA polymerase.

32. The composition of Claim 31, wherein said mutant DNA polymerase comprises a mutation that reduces a 3'-5' exonuclease activity of said DNA polymerase.

33. The composition of Claim 31, wherein said mutant DNA polymerase comprises a mutation that reduces a 5'-3' exonuclease activity of said DNA polymerase.

34. The composition of Claim 31, wherein said mutant DNA polymerase comprises a mutation resulting in said DNA polymerase having reduced discrimination against dideoxynucleotides.

35. The composition of Claim 31, wherein said DNA molecule is selected from the group consisting of pM284, pD323E, and pD323,389A.

36. The composition of Claim 31, wherein said DNA molecule further comprises expression control elements.

37. The composition of Claim 36, wherein said expression control elements comprise an inducible promoter.

38. A method of producing a mutant *Thermotoga neapolitana* DNA polymerase, said method comprising:

- (a) culturing a cellular host cell comprising a gene encoding a mutant *Thermotoga neapolitana* DNA polymerase;
- (b) expressing said gene; and
- (c) isolating said mutant *Thermotoga neapolitana* DNA polymerase from said host cell.

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(cont.)
39. The method of Claim 38, wherein said host is *E. coli*.

40. A mutant *Thermotoga neapolitana* DNA polymerase having a mutation that substantially reduces or eliminates 3'-5' exonuclease activity of said polymerase, wherein said mutation is in the 3'-5' exonuclease domain of said polymerase, and further wherein said mutant *Thermotoga neapolitana* DNA polymerase is a Pol I-type DNA polymerase.

41. An isolated DNA molecule comprising a DNA sequence encoding a mutant *Thermotoga neapolitana* DNA polymerase having a mutation that substantially reduces or eliminates 3'-5' exonuclease activity of said polymerase, wherein said mutation is in the 3'-5' exonuclease domain of said polymerase, and further wherein said mutant *Thermotoga neapolitana* DNA polymerase is a Pol I-type DNA polymerase.

42. A recombinant host cell comprising a DNA sequence encoding a mutant *Thermotoga neapolitana* DNA polymerase having a mutation that substantially reduces or eliminates 3'-5' exonuclease activity of said polymerase, wherein said mutation is in the 3'-5' exonuclease domain of said polymerase, and further wherein said mutant *Thermotoga neapolitana* DNA polymerase is a Pol I-type DNA polymerase.

43. A method of producing a mutant *Thermotoga neapolitana* DNA polymerase, said method comprising:

- (a) culturing a host cell comprising a gene encoding a mutant *Thermotoga neapolitana* DNA polymerase having a mutation that substantially reduces or eliminates 3'-5' exonuclease activity of said polymerase, wherein said mutation is in the 3'-5' exonuclease domain of said polymerase, and further wherein said mutant *Thermotoga neapolitana* DNA polymerase is a Pol I-type DNA polymerase;

- (b) expressing said gene; and
- (c) isolating said mutant *Thermotoga neapolitana* DNA polymerase from said host cell.

44. A mutant *Thermotoga neapolitana* DNA polymerase having a mutation that substantially reduces or eliminates 5'-3' exonuclease activity of said polymerase, wherein said mutation is in the 5'-3' exonuclease domain of said polymerase, and further wherein said mutant *Thermotoga neapolitana* DNA polymerase is a Pol I-type DNA polymerase.

45. An isolated DNA molecule comprising a DNA sequence encoding a mutant *Thermotoga neapolitana* DNA polymerase having a mutation that substantially reduces or eliminates 5'-3' exonuclease activity of said polymerase, wherein said mutation is in the 5'-3' exonuclease domain of said polymerase, and further wherein said mutant *Thermotoga neapolitana* DNA polymerase is a Pol I-type DNA polymerase.

46. A recombinant host cell comprising a DNA sequence encoding a mutant *Thermotoga neapolitana* DNA polymerase having a mutation that substantially reduces or eliminates 5'-3' exonuclease activity of said polymerase, wherein said mutation is in the 5'-3' exonuclease domain of said polymerase, and further wherein said mutant *Thermotoga neapolitana* DNA polymerase is a Pol I-type DNA polymerase.

47. A method of producing a mutant *Thermotoga neapolitana* DNA polymerase, said method comprising:

- (a) culturing a host cell comprising a gene encoding a mutant *Thermotoga neapolitana* DNA polymerase having a mutation that substantially reduces or eliminates 5'-3' exonuclease activity of said polymerase, wherein said mutation is in the 5'-3' exonuclease domain of said polymerase, and further wherein said mutant *Thermotoga neapolitana* DNA polymerase is a Pol I-type DNA polymerase;
- (b) expressing said gene; and
- (c) isolating said mutant *Thermotoga neapolitana* DNA polymerase from said host cell.